REMARKS

Upon entry of this amendment, claims 23 – 49 are all the claims pending in the application. Claims 1 – 22 have been canceled by a previous amendment. Claims 23, 24, 31, 32 and 35 have been amended. No new matter has been added. In view of the above amendments and the following remarks, reconsideration and further examination are requested.

Applicants note that editorial amendments have been made to the specification to overcome the objections discussed below and for grammatical and general readability purposes. No new matter has been added.

Objection under 35 U.S.C. § 132(a)

The amendment filed February 12, 2008 has been objected to under 35 U.S.C. 132(a) because the Examiner alleged that it introduces new matter into the disclosure. In response, Applicants have amended the specification in a manner to overcome the objection. In particular "wavelength" has been changed to --band width--. Accordingly, Applicants respectfully request that the objection be withdrawn.

Objection to the Drawings

The Examiner objected to the drawings as failing to comply with 37 CFR 1.84(p)(5) because Figures 8A-8C includes reference character "602" [*sic*, based on a telephone conference with the Examiner on June 17, 2008] not mentioned in the specification. In response, Applicants have amended the specification in a manner to overcome the objection. In particular reference number 602 has been inserted where appropriate. Accordingly, Applicants respectfully request that the objection be withdrawn.

Claim Rejections under 35 U.S.C. § 102

Claims 22 - 25, 29, 31-36, 38, 42 and 46 have been rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,499,256 to Bischel et al. Applicants respectfully traverse this rejection and respectfully submit that Bischel et al. fails to disclose or suggest each and every element of independent claims 23, 24, 31, 32 and 35, as amended.

As a minor formality, Applicants note that claim 22 was canceled in the previous response and therefore submit that the rejection of claim 22 is deemed to be moot.

Amended claims 23, 24, 31, 32 and 35 recite, *inter alia*, a combination of elements including:

"wherein an oscillation wavelength of the semiconductor laser is fixed such that (n2 – n1)/n1 is between 0.2% and 0.5% inclusive, n1 being a refractive index of the wavelength selecting filter/band pass filter/Bragg reflection grating with respect to light with a wavelength λ and n2 being a refractive index of the wavelength selecting filter with respect to a wavelength $\lambda/2$."

Bischel et al. disclose a polarized frequency-selective optical source. In column 20, lines 13-30, Bischel et al. asserts that if, for example, an 0.25 micron layer of a high index film such as TiO_2 is patterned on top of a single mode waveguide, the change in index of refraction is about 0.01, or ten times larger than that of the waveguide itself relative to the bulk. The description of FIG. 10 of Bischel et al. further discusses that the TE-TM wavelength selective filter 630 operated intracavity with a TE polarized exciter and a TM polarized waveguide 640 selects only a single wavelength for oscillation. *See* column 22, lines 19 - 45.

However, Bischel et al. fail to teach or suggest each and every element of the independent claims, namely, a fixed oscillation wavelength of the semiconductor laser that results in a range of between 0.2% and 0.5% inclusive for (n2 – n1)/n1, where n1 is the refractive index of the wavelength selecting filter/band pass filter/Bragg reflection grating with respect to a light having a wavelength λ, and n2 is the refractive index of the wavelength selecting filter/band pass filter/Bragg reflection grating with respect to a light having a wavelength $\lambda/2$.

According to independent claims 23, 24, 31, 32 and 35 of the present invention, when a

wavelength conversion element is used in combination, higher-order Bragg reflection must also be taken into account. As shown in FIG. 4, higher-order Bragg reflection is generated near $\lambda/2$ as a higher-order mode of the volume grating. To be utilized in the constitution of the present invention, the narrow-band reflection characteristics with respect to light with a wavelength λ must be transparent to a wavelength of $\lambda/2$, which is a higher harmonic wave. To this end, the wavelength of the higher harmonic wave and the reflection of close to $\lambda/2$, which is higher-order Bragg reflection, has to be shifted very slightly. Since the half band width of the phase matching wavelength tolerance of the wavelength conversion element is 0.1% of the phase matching wavelength, the difference $(n2 - n1)/n1$ between the refractive index n1 of the volume grating with respect to light with a wavelength λ and the refractive index n2 with respect to a wavelength $\lambda/2$ is preferably at least 0.2%. This allows the wavelength of the higher harmonic wave and the higher-order Bragg reflection to be shifted. The difference is even more preferably at least 0.5%. A refractive index difference of at least 0.5% will eliminate almost all of the effect of higher-order Bragg reflection.

Accordingly, in contrast, in Bischel et al. the change in index of refraction is about 0.01, or ten times larger than that of the waveguide itself relative to the bulk which would not eliminate almost all of the effect of higher-order Bragg reflection in accordance with range recited in the independent claims of the present invention.

Therefore, as Bischel et al. fails to anticipate independent claims 23, 24, 31, 32 and 35, Applicants respectfully submit that these claims are patentable over the reference and request that the rejection under 35 U.S.C. 102(b) be withdrawn.

Claims 25, 29, 33, 34, 36, 38, 42 and 46 depend from one of claims 23, 24, 31, 32 and 35 and are therefore considered patentable at least by virtue of their dependency.

Claim Rejections under 35 U.S.C. § 103(a)

Claims 26 – 28 and 30 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Bischel et al. Claim 37 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Bischel et al. in view of U.S. Patent No. 6,388,799 to Arnone et al. Claims 39-41 and 43-45

and 47-49 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over Bischel et al. in view of U.S. Patent No. 6,489,985 to Brodsky et al.

Applicants respectfully traverse these rejections at least because the Examiner has failed to establish a *prima facie* case of obviousness.

Bischel et al. has been discussed above. The Examiner cited Arnone et al. and Brodsky et al. in an attempt to cure the deficiencies of Bischel et al. regarding claims 26 – 28 and 30, 37, 39-41 and 43-45 and 47-49.

Claims 26-28 and 30 depend from one of claims 23 and 24. Accordingly, Applicants respectfully submit that claims 26-28 and 30 are patentable at least by virtue of their dependency.

Regarding claim 37, the same arguments discussed in the previous response still apply with respect to Arnone et al. Claim 37 also depends from claim 35. Applicants respectfully submit that Arnone et al. fails to cure the deficiencies of Bischel et al., as discussed above, with respect to claim 35. Accordingly, Applicants submit that claim 37 is patentable at least by virtue of its dependency.

Regarding claims 39-41 and 43-45, the same arguments discussed in the previous response still apply with respect to Brodsky et al. Claims 39-41, 43-45 and 47-49 depend from one of claims 23 and 35. Applicants respectfully submit that Brodsky et al. fails to cure the deficiencies of Bischel et al., as discussed above, with respect to claim 23, 32 or 35. Accordingly, Applicants submit that claims 39-41 and 43-45 are patentable at least by virtue of their dependency.

In summary, neither Arnone et al. or Brodsky et al. discuss eliminating almost all of the effect of higher-order Bragg reflection in accordance with range recited in the independent claims of the present invention. Thus, for these reasons, a person having ordinary skill in the art clearly would not have found it obvious to modify Bischel et al., or to make any combination of the references of record, in such a manner as to result in or otherwise render obvious the present invention of claims 23, 24, 31, 32 and 35.

Therefore, Applicants submit that claims 26 – 28 and 30, 37, 39-41 and 43-45 and 47-49 are not obvious in view of the cited references either singly or in combination and respectfully request that the rejection under 35 USC 103(a) be withdrawn.

Conclusion

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may best be resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Respectfully submitted,

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/Teresa M. Arroyo/

By: 2008.07.24 14:01:32 -04'00'

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